

REMARKS

Claims 1-6, 8-10, 21, 25, 28-48, 50-52, 55-57, and 60-79 are pending.

Claim Amendments

Several claims have been amended to overcome the claim objections and claim rejections under 35 USC §112, second paragraph.

With respect to claim 21, claim 21 now depends from pending claim 60 and refers to the chiral compound of claim 60. This amendment is not made to narrow the scope of this claim.

Claims 60, 69, and 76 have been amended to overcome the claim objections (citation in Action of claim 61 appears to be an error) and claims 60, 65, 69, 70, and 76 have been amended to delete superfluous language and to provide greater clarity. Applicants respectfully submit that these amendments do not narrow the scope of these claims. Furthermore, Applicants respectfully submit that the objections and claim rejections under 35 USC §112, second paragraph be withdrawn.

Claim Rejections Under 35 USC §112, Second Paragraph

Claims 60, 61, 65 and 69 stand rejected as allegedly being indefinite for having lines not terminating in substituent groups. Applicants respectfully traverse these rejections.

Particularly, Applicants respectfully submit that these claims merely define compounds comprising a radical. Applicants respectfully submit that one of skill in the art could readily understand the metes and bounds of these claims. Particularly, Applicants

respectfully submit that the breadth of a claim is not to be equated with indefiniteness (*In re Miller* 441 F2d 689, 169 USPQ 597 (CCPA 1971) and MPEP §2173.04). To the contrary, Applicants respectfully submit that one of ordinary skill would readily ascertain the metes and bounds of the present invention as defined by these claims.

With respect to claim 69, the action alleges that the term “silicylene” is unclear. Applicants respectfully traverse this assertion and submit that one of skill in the art would readily understand the term “silicylene”. See, e.g., the attached definition of silicylene from *Grant and Hackh's Chemical Dictionary*.

With respect to claim 71, claim 61 defines a compound including at least two chiral units. Applicants respectfully submit that claim 71 is sufficiently clear to define a supported cross-linked chiral compound comprising at least 1 chiral compound according to claim 61. Consequently, Applicants respectfully submit that this rejection should be withdrawn.

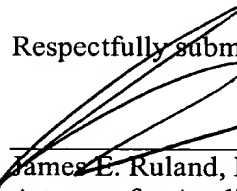
With respect to claim 75, Applicants respectfully submit that claim 75 defines a group Q formed by one of the following groups. Consequently, Applicants respectfully submit that one of skill in the art would readily understand that the cited groups are precursors used to form a group Q having two bonds present in the polymerizable precursor.

With respect to claim 76, Applicants respectfully submit that the term heteroholides and the other osides are defined in the present specification. See, e.g., page 8, lines 5-10. Consequently, Applicants respectfully submit that these rejections should be withdrawn.

In view of the above remarks, favorable reconsideration is courteously requested. If there are any remaining issues which can be expedited by a telephone conference, the Examiner is courteously invited to telephone counsel at the number indicated below.

The Commissioner is hereby authorized to charge any fees associated with this response that may be required and are not attached or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



James E. Ruland, Reg. No. 37,432
Attorney for Applicants

MILLEN, WHITE, ZELANO &
BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

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GRANT & HACKH'S CHEMICAL DICTIONARY

[*American, International, European and British Usage*]

*Containing the Words Generally Used in Chemistry,
and Many of the Terms Used in the Related
Sciences of Physics, Medicine, Engineering,
Biology, Pharmacy, Astrophysics,
Agriculture, Mineralogy, etc.*

Based on Recent Scientific Literature

FIFTH EDITION

Completely Revised and Edited by

ROGER GRANT

M.A., D. de l'U., Ph.D., C. Chem., M.R.S.C. Consultant

CLAIRE GRANT

M.B., B.S., M.R.C.P.E. Medical Practitioner

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tri ~ $\text{H}_6\text{Si}_3\text{O}_{10}$ = 250.3. White, insoluble powder.
 tetrahydrogen decawolframo ~ $\text{SiO}_2 \cdot 10\text{WO}_3 \cdot 2\text{H}_2\text{O}$ = 2415.
 Silico(dec) tungstic acid. White powder; a reagent for cesium (insoluble salts).
 silicide Compounds of the type M_xSi_y , as, Mg_2Si , CaSi_2 , Fe_3Si .
 silicification The gradual replacement of rocks or fossils by silica. Cf. petrification.
 silicified Describing an organic material, e.g., wood, that has been petrified.
 silicium Silicon.
 silico- Prefix indicating silicon, generally in organic compounds. s. benzoic acid PhSiOOH = 138.2, m. 92, insoluble in water. s. bromoform SiHBr_3 = 268.8. Heavy, colorless liquid, d. 2.7, b. 116, decomp. by water. s. butane See silanes. s. calcium A product of the electric furnace used to deoxidize steel. s. chloroform SiHCl_3 = 135.5. Colorless liquid, d. 1.34, b. 34, decomp. by water. s. decitungstic acid Tetrahydrogen decawolframosilicic acid. s. ethane See silanes. s. fluoride Hexafluorosilicate*. s. fluoric acid Hexafluorosilicic acid*. s. heptane Triethyl silane*. s. hydrides Silanes*. s. iodoform SiHI_3 = 409.8. Heavy, colorless liquid, d. 3.4, b. 220, decomp. by water. s. methane Silane*. s. oxalic acid $\text{HOOSi} \cdot \text{SiOOH}$ = 122.2. White, unstable solid.
 silicol R_3SiOH . Hydroxysilane. triethyl ~ Et_3SiOH = 132.3. Silicoheptyl alcohol. Colorless liquid, b. 154, insoluble in water.
 silicon* Si = 28.0855. Silicium. A nonmetallic element of the carbon group, at. no. 14. Allotropic modifications: (1) Amorphous: Brown powder, d. 2.35. (2) Crystalline: Gray crystals, m. 1412, b. ca. 2480, insoluble in water. (3) Graphitoid: Dense crystals, or graphitelike masses deposited from molten s. (4) Adamantine: Hard needles. Principal valency 4. S. forms many complex compounds on the earth surface (rocks). Used in alloys to impart hardness, and in semiconductors. See silica minerals. ethyl ~ The radical $\equiv\text{SiEt}$. Cr. silanes. methyl ~ The radical $\equiv\text{SiMe}$. radio ~ A s. isotope, mass 27. Cf. radioelements.
 s. alkyls (1) Hydrogen compounds of s. corresponding with hydrocarbons; as, SiH_4 , silane. (2) Organic compounds of s. and alkyl radicals; as, Me_4Si . See silanes. s. alloys Noncorrodible alloys of s. with metals; as, Duriron. Cf. silicon copper. s. borides SiB_3 , SiB_4 , and SiB_6 exist. Black, irregular crystals, of high m.; very hard, and good conductors of electricity. s. bromides (1) SiBr_4 = 347.7. S. tetrabromide*. Colorless, fuming liquid, b. 154, decomp. by water to silicic acid. (2) Si_2Br_6 = 535.6. S. tribromide*. Colorless solid, b. 240, decomp. by water. s. bronze A noncorrodible alloy: Cu, Sn, with 1-4% Si. s. carbide* SiC = 40.10. Colorless plates, dissociates 2250; used in refractories and abrasives. s. chip A wafer of pure s. printed with alternate insulating and semiconducting layers, on which the pattern of an electric circuit is etched. Wafers fused together can contain thousands of circuits. s. chlorides (1) SiCl_4 = 169.9. S. tetrachloride*. Colorless, fuming liquid, d. 1.524, b. 58, decomp. by water to silicic acid. Used in electrotechnics, and mixed with ammonia vapors, in smoke screens. (2) Si_2Cl_6 = 268.9. S. trichloride, b. 146, decomp. by water. (3) Si_3Cl_8 = 367.9. S. octachloride*. White powder. s. controlled rectifier SCR. Thyristor. A fast-acting switching device made from 4 alternate layers of n- and p-type silicon. s. copper An alloy: Si 20-30, Cu 70-80%, used in metallurgy. s. dioxide* Silica. colloidal (NF). Used in pharmacy as a suspending agent and stabilizer (NF). s. disulfide* SiS_2 = 92.2. White needles, sublime when heated, decomp. by water. s. ethane See silanes. s. ethyl

Tetraethylsilane*. s. fluorides (1) SiF_4 = 104.1. S. Tetrafluoride*. Colorless, suffocating gas, b. -181.0°C , decomp. by water to hexafluorosilicic acid, soluble in alcohol. (2) Si_2F_6 = 170.2. S. subfluoride. White powder. s. hydrides Silanes*. s. iodides (1) SiI_4 = 535.7. S. tetraiodide*. Colorless solid, m. 121, insoluble in water. (2) Si_2I_6 = 817.6. S. subiodide. Colorless solid, m. 250 (in vacuo), decomp. by water. s. iron Ferrosilicon. Iron containing 2-15% Si; used in metallurgy. s. magnesium See magnesium silicides. s. methane Silane*. s. methyl Tetramethylsilane*. s. nitride Si_3N_4 = 140.3. White powder insoluble in water, existing in 2 hexagonal phases stable below and above $1400-1450^\circ\text{C}$, respectively. Very resistant to thermal shock and chemical reagents; used as a support for catalysts and in stator blades of high-temperature gas turbines. s. octachloride* See silicon chlorides. s. oxide Silica. s. oxychlorides Si_2OCl_6 , b. 137; $\text{Si}_4\text{O}_4\text{Cl}_8$, b. 200; $\text{Si}_4\text{O}_3\text{Cl}_{10}$, b. 153; also $(\text{SiOCl}_2)_n$, $\text{O}(\text{SiCl}_3)_2$, where $n = 1$ to 4. s. steel Steel containing 2-3% Si; hard and brittle. s. sulfide S. disulfide*. s. tetrabromide* See silicon bromides. s. tetrachloride* See silicon chlorides. s. tetrafluoride* See silicon fluorides. s. tetraiodide* See silicon iodides. s. tetraphenyl Tetraphenylsilane*. s. tungstic acid Silicotungstic acid. s. zirconium An alloy used to purify molten steel.
 silicone (1) Contraction of silicoketone. A polymer containing $-\text{Si}(\text{R})_2\text{O}-$ groups. Lower molecular weight compounds are oils (used as lubricants and in polishes); higher are inert solids with good electrical insulation properties. (2) $\text{H}_2\text{Si}_2\text{O}_2$ = 119.3. Yellow solid. s. alloy A compound produced by the simultaneous polymerization of 2 silicones; e.g., tetra vinyl s. and methyl hydrogen siloxane give a s. alloy of high water repellency. s. release paper Protective backing paper that is easily removed when required, as on self-adhesive labels. s. rubber A s. that retains its elastic properties between -50 and $+291$, and can be kneaded; used for protective coatings on wires and for high-temperature lubricants.
 siliconic acid $\text{R} \cdot \text{SiOOH}$, analogous to organic acids. Cf. carbylic acid.
 silicono The radical $(\text{HO})\text{OSi}-$, derived from metasilicic acid.
 Silicool Trademark for a protein synthetic fiber.
 silicosis A form of pneumoconiosis due to silica dust less than $10 \mu\text{m}$ in diameter. U.K. limit is 0.1 mg/m^3 of respirable air.
 silicotungstate A salt of silicotungstic acid, especially with the alkaloids.
 silicotungstic acid $\text{H}_4[\text{SiW}_{12}\text{O}_{40}]$ = 2878. Tetrahydrogen dodecawolframosilicate*. Dodecawolframosilicic acid*. Yellow crystals, soluble in water; used in alkaloid analysis.
 silicyl The silyl* radical. di ~ The disilanyl* radical. s. oxide $(\text{R}_3\text{Si})_2\text{O}$; as hexaethyl ~ $(\text{Et}_3\text{Si})_2\text{O}$ = 246.5. Colorless liquid, b. 231.
 silicylene The silanediyl* radical.
 silk (1) Fibroin, sericin. The fibrous envelope of the silkworm before the chrysalis state (cocoon). It consists of fibroin (the fiber protein) and sericin (the gummy protein). (2) A sieve for grading flour: no. 5 = 0.270 , no. 8 = 0.190 mm aperture. (3) A series of parallel fine-line inclusions in certain gems (e.g., rubies). Cf. asterism. "all- ~" S. containing fillers, but no other fibers. artificial ~ Rayon. net ~ S. fabric made from yarns of continuous s. filament. pure ~ S. fibers without fillers. schappe ~, spun ~ Describing a fabric made from silk-waste staple fiber. vegetable ~ (1) The floss from the seeds of *Calotropis gigantea* (Asclepiadaceae), Asia. (2) Kapok.

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The previous edition of this book was *Hackh's Chemical Dictionary*,
4th ed., published by McGraw-Hill in 1969. It was prepared by Dr.
Julius Grant from a *Chemical Dictionary* compiled by Ingo W. D.
Hackh. The current, or 5th, edition of this book was prepared by Dr.
Roger L. Grant, whose father prepared the 4th edition.

*The editors for this book were Betty J. Sun and Susan Thomas,
the designer was Naomi Auerbach, and the production
supervisor was Teresa F. Leaden. It was set in Palatino
by University Graphics, Inc.*

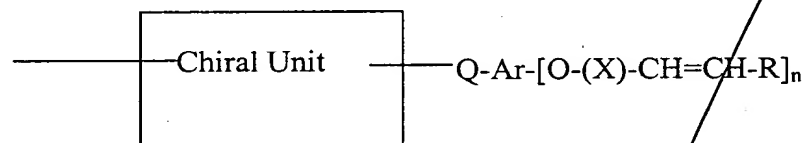
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IN THE CLAIMS:

Please cancel claims 7, 18-20, 22-24, 26, 27, 49, 53, 54, 58 and 59 without prejudice or disclaimer.

Please add claims 60-79 as follows:

~~60.~~ A cross-linked chiral compound made by reacting at least one functional group of at least one chiral unit with a compound of the formula I: $[R-CH=CH-(X)-O]_n-Ar-Q$, to create a polymerizable precursor:

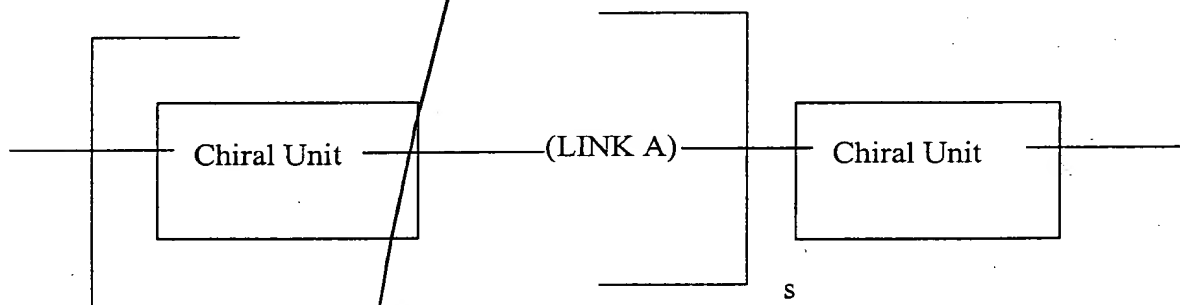


and polymerizing the precursor to create a cross-linked chiral compound where:

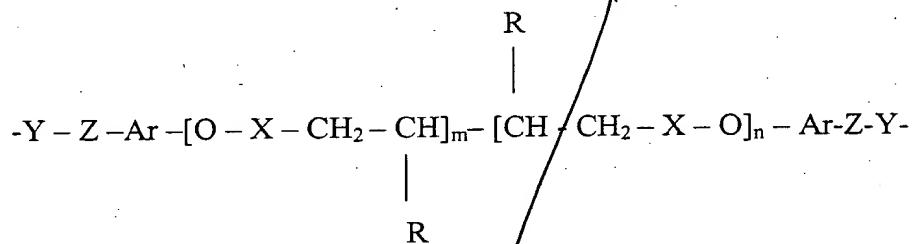
- chiral unit is a monomeric, oligomeric, cyclooligomeric or polymeric chiral radical and wherein the radical optionally comprises a primary or secondary amine function or a primary, secondary or tertiary hydroxyl function or a sulphhydryl function and in which all or a portion of these functions have optionally been modified to the ester, amide, urea, carbamate, thioester or thiocarbamate wherein the chiral unit optionally has 2 or more functional groups reactable with a compound of formula I or a compound linkable to a support;
- ma Gr

- F1
- Q is a group which is reactive towards a hydrogen carried by a heteroatom selected from the group formed by oxygen, nitrogen and sulphur, or a precursor of such a group;
 - Ar is an arylene or polyarylene optionally substituted with at least one group selected from the group formed by alkyl, alkoxy, hydroxyl, trihalogenoalkyl, silyl, thiol, amino, aminoalkyl, amide, nitro, nitrosamino, N-amino, aldehyde acid and ester groups;
 - X is a linear alkylene group carrying more than one carbon atom, a branched alkylene group, or an arylene group, optionally substituted with at least one group selected from the group formed by alkyl, alkoxy, hydroxyl and trihalogenoalkyl groups;
 - R is hydrogen, a linear or branched alkyl group, a linear or branched alkoxy group, a hydroxyl or an aryl group, optionally substituted; and
 - n is in the range 1 to 20.

61. A cross-linked compound according to claim 60 wherein the polymerizable precursor reacts to create a LINK A between two chiral units:



wherein LINK A is:



where the chiral unit, Ar, X and R are defined as in claim 60 and

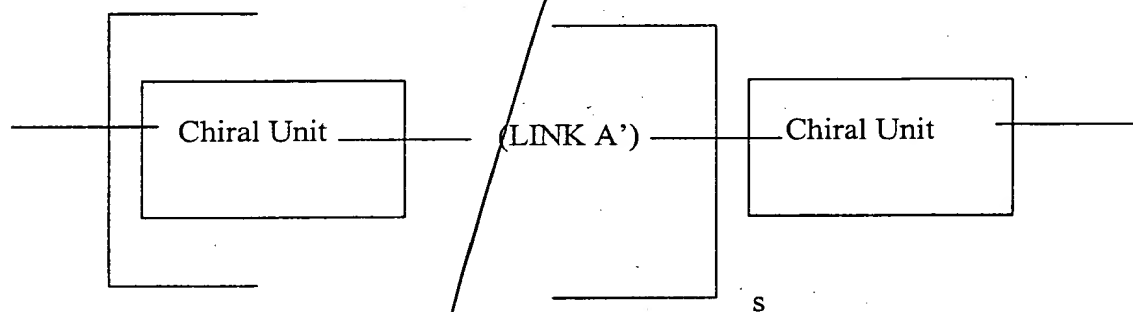
- Z is a -CH₂- group, a -CO- group, a -NH-CO- group, or a -NH-CS- group;
- m is 1 - 20;
- n is 1 - 20;
- s is at least 1 and less than 20000; and
- Y is a sulphur or oxygen atom or the amino group.

62. A hydrosilylated compound made by hydrosilylating a polymerizable precursor of a chiral compound according to claim 60 with a silane of the formula (R₁, R₂, R₃)Si—H; where

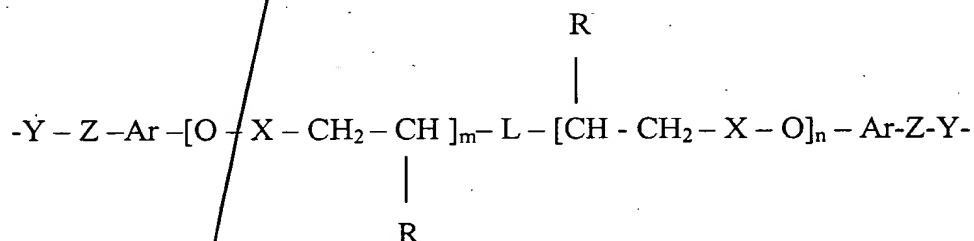
R₁ is hydrogen, an alkoxy group, a halogen, or an amino or alkylamino group; and

R₂ and R₃, which may be identical to or different from R₁ to transform at least a portion of the alkenyl moieties R—CH=CH--, are alkoxy, hydroxyl, trihalogenoalkyl, linear or branched alkyl or aryl groups.

63. A cross-linked compound according to claim 60 wherein the hydrosilylated polymerizable precursor reacts to create a LINK A' between two chiral units:



wherein LINK A' is:



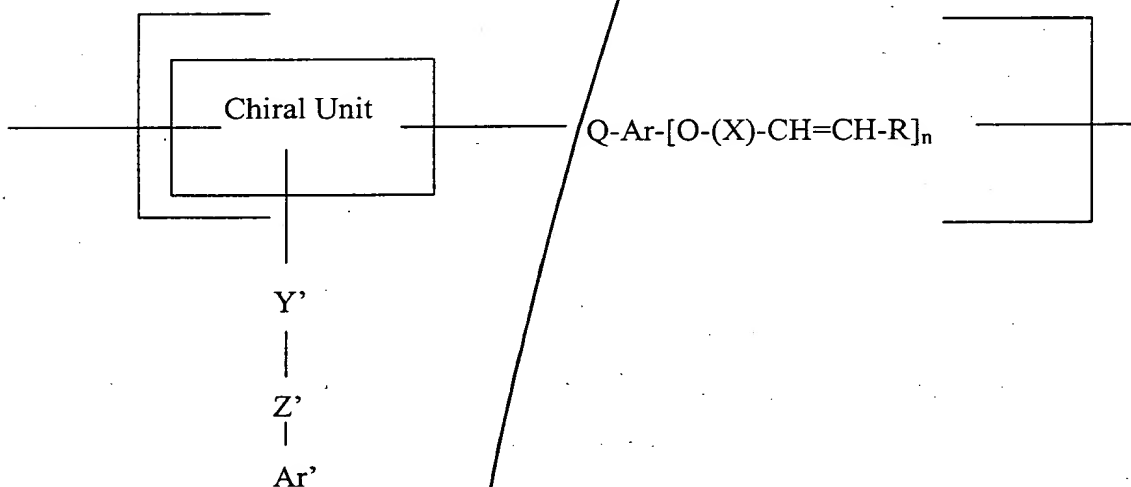
where the chiral unit, Ar, X and R are defined as in claim 60 and

- Z is a $-\text{CH}_2-$ group, a $-\text{CO}-$ group, a $-\text{NH}-\text{CO}-$ group, or a $-\text{NH}-\text{CS}-$ group;
- m is 1-20;
- n is 1 - 20;
- s is at least 1 and less than 20000;
- L is a silicylene; and
- Y is a sulphur or oxygen atom or the amino group.

64. A cross-linked compound, made by reacting the at least one chiral unit according to claim 60 with:

a compound of the formula I: $[R-CH=CH-(X)-O]_n-Ar-Q$ where R, X, n, Ar, and Q are defined as in claim 60, and

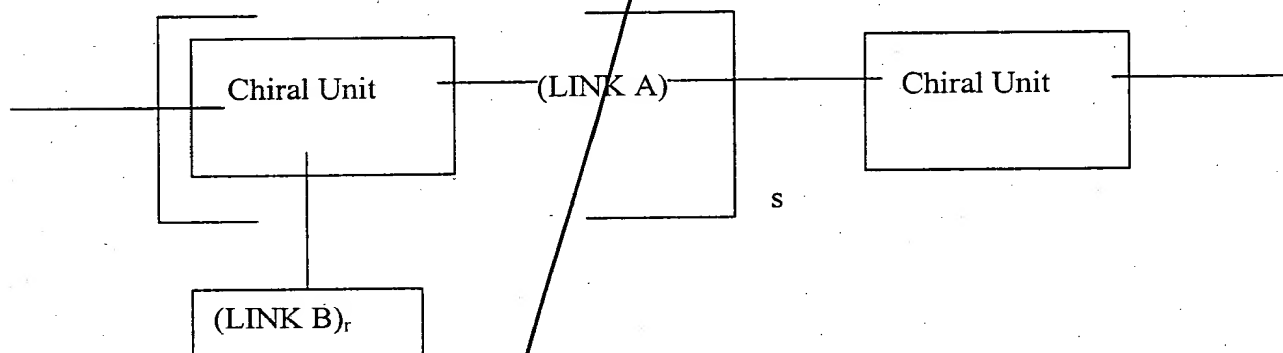
a compound of the formula II: $Ar'-Z'$ to make a polymerizable precursor of the formula III where Ar' is an aryl or polyaryl group optionally substituted by at least one alkyl and Z' is a $-CH_3$ group, a $-COH$ group, a $-NCO-$ group, or a $-NCS-$ group:



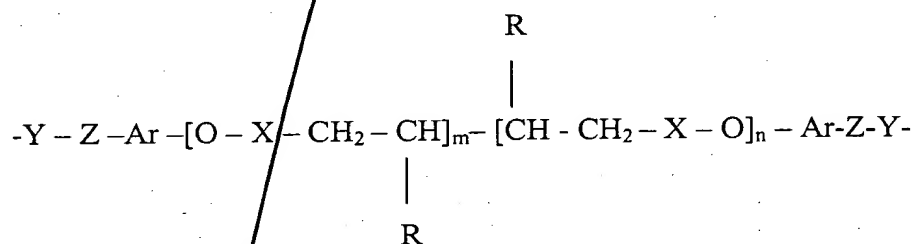
where:

- Y' is a sulphur or oxygen atom, or the amino group; and
- Z' is a $-CH_2-$ group, a $-CO-$ group, a $-NH-CO-$ group, or a $-NH-CS-$ group; and
- Ar' is aryl or polyaryl group.

65. A crosslinked chiral compound linked to a support, made by reacting and polymerizing a polymerizable precursor of the formula III, to make a crosslinked chiral compound linked to a support:



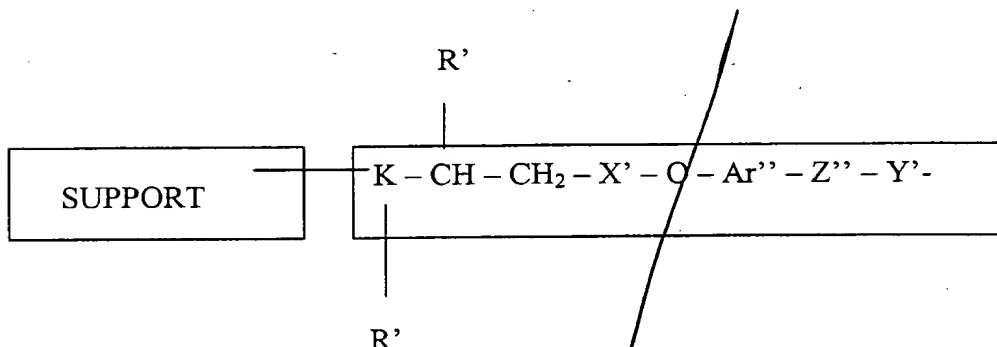
wherein LINK A is:



where the chiral unit, Ar, X and R are defined as in claim 60 and

- Z is a $-\text{CH}_2-$ group, a $-\text{CO}-$ group, a $-\text{NH}-\text{CO}-$ group, or a $-\text{NH}-\text{CS}-$ group;
- m is 1 – 20;
- n is 1 – 20;
- r is ≥ 1 ;
- s is at least 1 and less than 20000; and
- Y is a sulphur or oxygen atom or the amino group; and

wherein LINK B is:

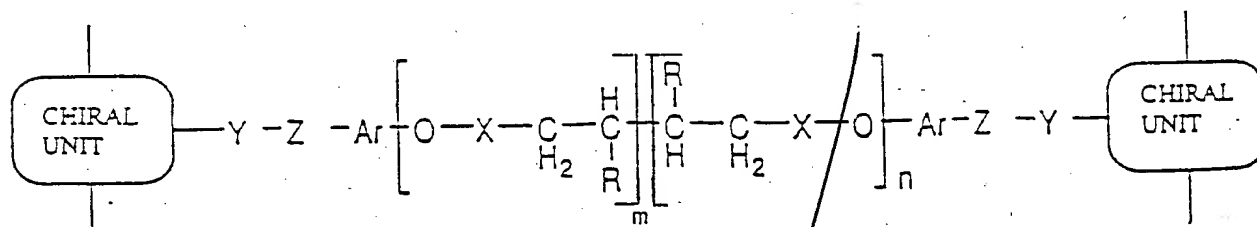


where:

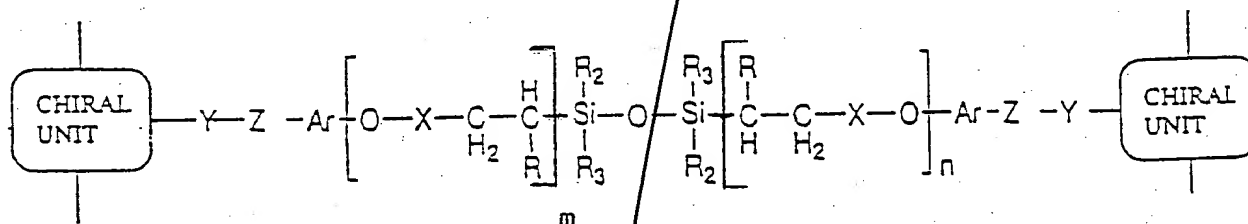
- F1
- X' is alkylene or arylene;
 - Y' is a sulphur or oxygen atom or the amino group;
 - Z'' is a -CH₂- group, a -CO- group, a -NH-CO- group, or a -NH-CS- group;
 - Ar'' is an arylene or a polyarylene group;
 - K is a single bond, a siloxane, or a silane wherein, if K is a single bond, R is not present in LINK B;
 - R' is an alkyl group or hydrogen; and
 - "support" is an organic or mineral support; functionalised by an alkene or a hydrogenosilane or a sulphhydryl.

66. A crosslinked chiral compound according to claim 61, in which the chiral compound is polymerized by cross-linking at least a portion of the alkenyl moieties to obtain polymer beads which essentially constitute a chiral support.

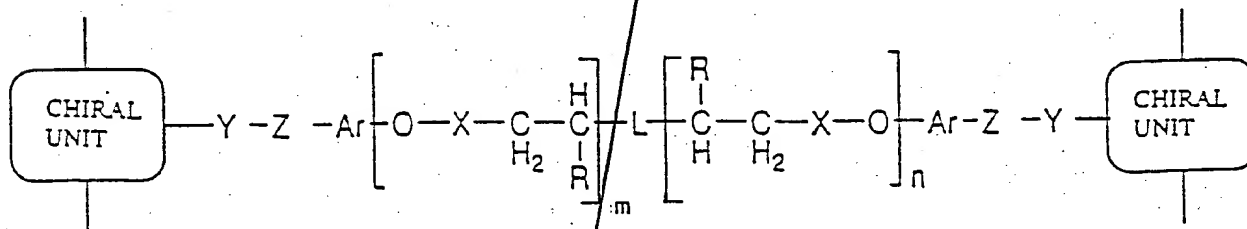
67. A cross-linked chiral compound according to claim 61, having the following formula:



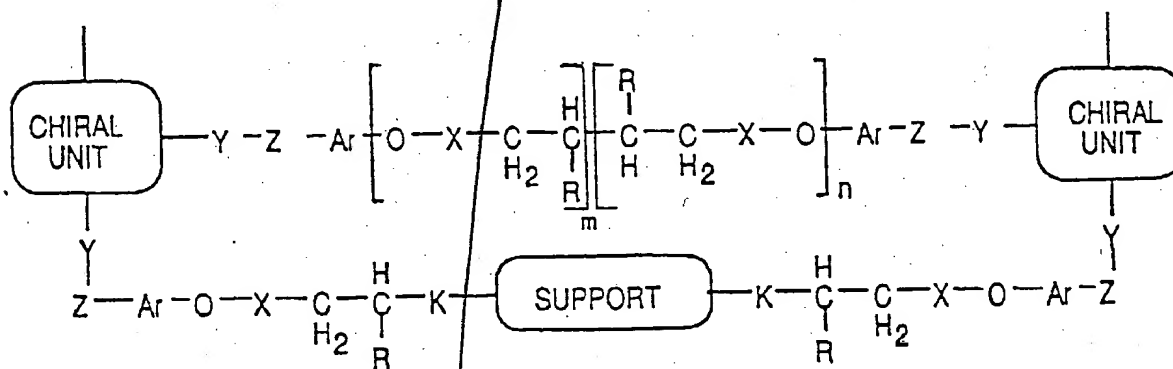
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68. A cross-linked chiral compound according to claim 63, having the following formulae:

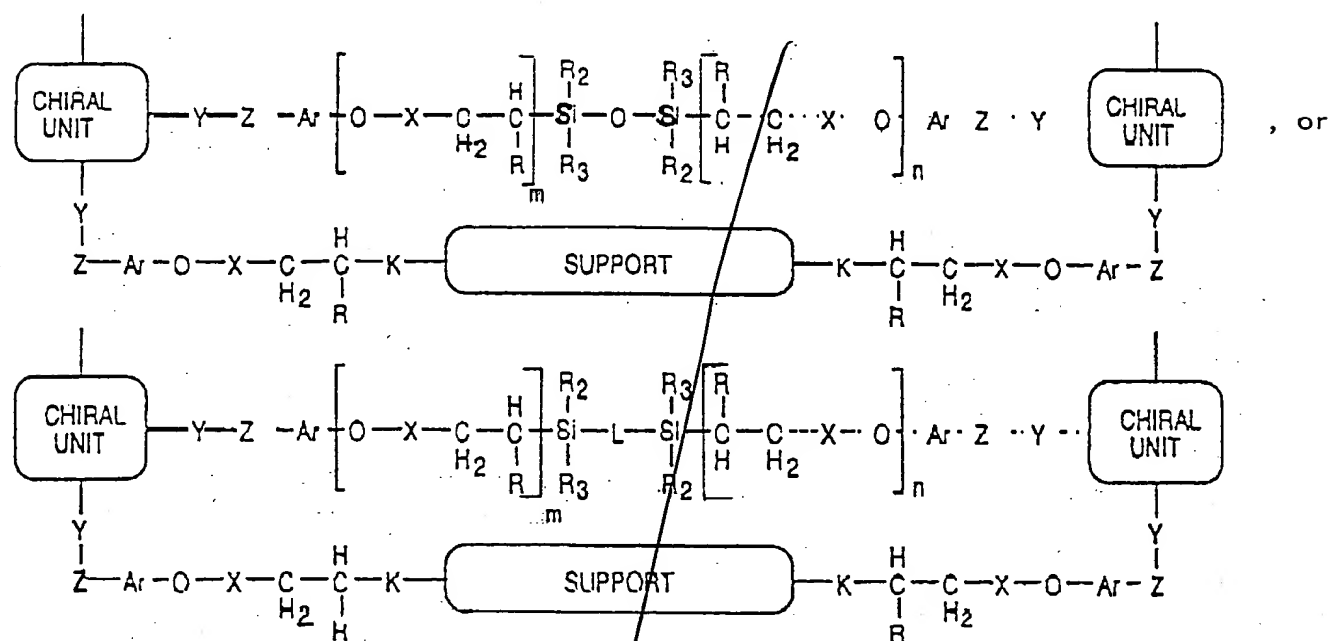


or



69. A cross-linked chiral compound having the following formulae:





where

- a chiral unit is a monomeric, oligomeric, cyclooligomeric or polymeric chiral radical and wherein the radical optionally comprises a primary or secondary amine function or a primary, secondary or tertiary hydroxyl function or a sulphhydryl function and in which all or a portion of these functions have optionally been modified to the ester, amide, urea, carbamate, thioester or thiocarbamate wherein the chiral unit optionally has 2 or more functional groups reactable with a compound of formula I or a compound linkable to a support;
- Ar is an arylene or polyarylene optionally substituted with at least one group selected from the group formed by alkyl, alkoxy, hydroxyl, trihalogenoalkyl, silyl, thiol, amino, aminoalkyl, amide, nitro, nitrosamino, N-amino, aldehyde acid and ester groups;

- F1
- X is a linear alkylene group carrying more than one carbon atom, a branched alkylene group, or an arylene group, optionally substituted with at least one group selected from the group formed by alkyl, alkoxy, hydroxyl and trihalogenoalkyl groups;
 - R is hydrogen, a linear or branched alkyl group, a linear or branched alkoxy group, a hydroxyl or an aryl group, optionally substituted;
 - Z is a $-\text{CH}_2-$ group, a $-\text{CO}-$ group, a $-\text{NH}-\text{CO}-$ group, a $-\text{NH}-\text{CS}-$ group;
 - m is 1 – 20;
 - n is 1 – 20;
 - Y is a sulphur or oxygen atom or the amino group;
 - L is a silicylene;
- R_2 and R_3 , which may be identical to or different from R_1 to transform at least a portion of the alkenyl moieties $\text{R}-\text{CH}=\text{CH}-$, are alkoxy, hydroxyl, trihalogenoalkyl, linear or branched alkyl or aryl groups;
- K is a single bond, a siloxane, or a silane wherein, if K is a single bond, R is not present in LINK B; and
 - “support” is an organic or mineral support; functionalised by an alkene or a hydrogenosilane or a sulphhydryl.

70. A supported cross-linked chiral compound obtainable from a chiral compound according to claim 65 and a support, said support having been reacted with at least one group selected from the group formed by alkoxy, halogeno or aminosilane groups to form a derivative, said group also comprising a function of the type $-\text{SH}$, $-\text{SiH}$ or $-\text{CH}=\text{CH}-$, by

forming covalent chemical bonds using at least part of the alkenyl moieties in said chiral compound.

71. A supported cross-linked chiral compound comprising at least one chiral compound according to claim 61 and at least one support.

F2 72. A supported cross-linked chiral compound according to claim 65, in which the chiral compound is chemically bonded to said support, using at least one covalent chemical bond.

73. A supported cross-linked chiral compound obtainable from a chiral compound according to claim 60 by polymerization, generally by cross-linking at least a portion of the alkenyl moieties of said chiral compound to obtain polymer beads.

74. A supported cross-linked chiral compound comprising beads of a chiral compound according to claim 61.

75. A cross-linked chiral compound according to claim 61, in which group Q is selected from the group formed by one of the following groups: $-N=C=O$ or a precursor thereof; $-NH_2$ or $-CON_3$; $-COC1$ or its precursor; $-COOH$; $-N=C=S$; or $-CH_2Y$, where Y is Cl, Br, I, methylsulphonyloxy, para-toluenesulphonyloxy, or 3,5-dimethylphenylsulphonyloxy.

76. A cross-linked chiral compound according to claim 61, in which said chiral unit of a product is a glycosidic unit of a product selected from holosides, heteroholisides, oligosides, cyclooligosides, heterooligosides, polyosides, heteropolyosides, enzymes and proteins.

F1
77. A cross-linked chiral compound according to claim 64, in which group Q is selected from the group formed by one of the following groups: $-N=C=O$ or a precursor thereof; $-NH_2$ or $-CON_3$; $-COCl$ or its precursor; $-COOH$; $-N=C=S$; or $-CH_2Y$, where Y is Cl, Br, I, methylsulphonyloxy, para-toluenesulphonyloxy or 3,5-dimethylphenylsulphonyloxy.

78. A cross-linked chiral compound according to claim 64, in which said chiral unit of a product is a glycosidic unit of a product selected from holosides, heteroholisides, oligosides, cyclooligosides, heterooligosides, polyosides, heteropolyosides, enzymes and proteins.

79. A crosslinked chiral compound according to claim 60, in which the chiral compound is polymerized by cross-linking at least a portion of the alkenyl moieties to obtain polymer beads which essentially constitute a chiral support.--

REMARKS

Claims 1-6, 8-10, 21, 25, 28-48, 50-52, 55-57, and 60-79 are pending with claims 7, 18-20, 22-24, 26, 27, 49, 53, 54, 58 and 59 being canceled, and claims 60-79 being added.

Objection to Drawings

Applicants filed a separate paper on November 5, 2002, obviating these grounds of objections. Consequently, Applicants respectfully submit that they should be withdrawn.

Objection to Disclosure

Applicants have amended the specification to obviate these objections to the disclosure.

Claim Rejections Under 35 U.S.C. § 112, First and Second Paragraphs

Applicants have canceled the rejected claims and added claims to obviate these grounds of rejections. These amendments have not been made to narrow the scope of the claims.

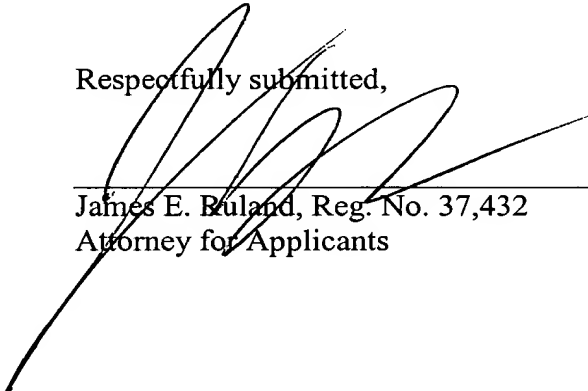
The Action alleges that there appears to be no basis that the process as described results in two allyl groups being reductively dimerized to form a hexamethylene group in the presence of a benzoyl peroxide catalyst. Applicants respectfully submit that the hydrogen atoms from exchange with atmospheric air are naturally contained in the reaction medium. This exchange allows reductive polymerization without adding hydrogen.

In view of the above remarks, favorable reconsideration is courteously requested.

If there are any remaining issues that can be expedited by a telephone conference, the Examiner is courteously invited to telephone Counsel at the number indicated below.

The Commissioner is hereby authorized to charge any fees associated with this response that may be required and are not attached or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



James E. Buland, Reg. No. 37,432
Attorney for Applicants

MILLEN, WHITE, ZELANO &
BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

Attorney Docket No.: PET-1638 D1

Date: January 6, 2003

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